



Food and Agriculture  
Organization of the  
United Nations



General Fisheries  
Commission for  
the Mediterranean

## Summary of GFCM work on VMS trials as relevant to the ongoing collaboration between IOTC and GFCM on the implementation of VMS in each organization

**Executive Summary:** In the context of the ongoing joint VMS pilot project between IOTC and GFCM, launched in 2022 subsequent to the approval of the Compliance Committees of both organizations, the IOTC VMSWG requested the GFCM Secretariat to provide information on main technical features stemming from the ongoing work of the GFCM on VMS, including trials with Contracting Parties. In this regard, this document summarises the methodology being used by the GFCM towards the execution of these trials, as foreseen in the course of 2023. This might offer a number of options for consideration by IOTC in the context of its discussions on the establishment of a VMS.

### INTRODUCTION

This document has been prepared in response to requests expressed at the IOTC VMSWG of 16 November 2022 where the GFCM Secretariat was encouraged to provide a summary of the work done on VMS in the broader context of the ongoing pilot project between IOTC and GFCM. It consists of a cursory description of preliminary considerations and common hurdles as identified during the joint VMS pilot so far and of a technical annex recapping main features of the methodology used by the GFCM as relating to its work on VMS.

### PRELIMINARY CONSIDERATIONS AND COMMON HURDLES

Both the GFCM and IOTC Secretariats are in the process of establishing their own VMS systems. While the GFCM Secretariat has made more progress to date, most notably via the launching of a pilot system back in 2019, the two organizations are dealing with a number of common hurdles, including those stemming from the institutional belonging of both RFMOs to the FAO, and therefore being subject to the same administrative rules in place. In this context, the experience of the trials being carried out under the umbrella of the GFCM with its Contracting Parties could facilitate the obtaining of technical clearances by relevant FAO units concerned, including when/if IOTC should decide to establish its own regional VMS.

Main common hurdles for IOTC and GFCM identified so far include, inter alia, the presence, in the respective memberships, of countries devoid of a Fishing Monitoring Centre (FMC), the need to build a modular system which can encompass additional MCS technology, the relevance of monitoring small-scale fisheries (SSF) activities, including if relevant via AIS, and the potential use of NAF and EU/FLUX data transmission protocols (e-inspection reports refer). On top of this, applicable data confidentiality policies in place at the FAO and IT standards being used by the Organization are also to be considered. In this context, sharing lessons learnt from the GFCM experience in addressing these hurdles could facilitate progress by IOTC in view of a future implementation of VMS.

Initial considerations indicate that both IOTC and GFCM could be interested in similar type of VMS, namely a system which would be hybrid and foster at the same time a centralised and decentralised approach. Consequently, the majority of electronic control provisions and technical standards which

have been included in the GFCM pilot regional VMS could be appropriate to address the requirements currently being examined by IOTC in view of establishing its own VMS. While MCS provisions for IOTC Contracting Parties would mainly apply to commercial fishing vessels targeting tuna, discussions so far revealed that trials on the applicability of MCS technologies tailored to SSF too, as currently incorporated in the methodology followed by the GFCM for VMS trials, could be explored.

VMS trials by GFCM could shed light on a number of issues of relevance to the ongoing discussions within IOTC, including: i) the feasibility to establishing a regional VMS even when some Contracting Parties lack FMCs; and ii) the financial impact of running a VMS.

## MAIN FEATURES OF THE GFCM TRIALS ON VMS

Through the foreseen GFCM VMS trials, an initial effort is required to define the boundaries and specificities of monitoring and control practices with a view to simulating scenarios tailored to the needs of its Contracting Parties. A number of features are expected to be used by GFCM in its trials, as defined in the context of the work of the GFCM Compliance Committee and its working groups, and they are summarized below, broken down by phases.

### **1. Planning**

#### **1.1. Streamlining background information**

The need to establish close coordination with Contracting Parties to agree on practical arrangements and the scope of the VMS trials is required. This coordination is to at least address the streamlining of the following background information:

- *Identification of Contracting Parties relevant to the control approach to be tested (centralized vs decentralized);*
- *Selection of sample vessels participating in the pilot and testing ports;*
- *Acquisition of vessel information to be imported on the VMS software platform underpinning the functioning of transponder units;*
- *Data on geofencing mechanisms to be embedded in the platform (if any);*

#### **1.2. Technology identification and management**

Bearing in mind the specificities of the different VMS trials and vessels involved, concerned core transponder specifications are to be identified in the context of said coordination with the Contracting Parties and with a view to ensuring their connection via application programming interfaces (APIs). Under this methodology, liaison is required between the GFCM Secretariat and potential transponder providers. For each Contracting Party to be involved in the VMS trials, these are the main steps to be followed:

- *Selection and of transponder units;*
- *Acquisition of hardware + SIM cards (for hybrid sat-cellular VMS)*
- *Installation of SIM cards, configuration of access point name (APN) and activation + registration on selected satellite constellation(s);*
- *Liaison with transponder providers to inform about the eligible recipients for transponder data (i.e. national authorities' VMS platforms in case an FMC is present or the Secretariat if direct transmission to the pilot is foreseen);*
- *Integration of transponder APIs with main recipients' platform;*
- *Installation of Lithium batteries (for SSF units);*
- *Establishment of a management register (serials/warranty duration/expiration date for units/SIMs/batteries).*

#### **1.3. Coordination underpinning field activities**

Field activities in Contracting Parties are to be preceded by liaison with the transponder providers and the national authorities concerned on:

- *Logistics (hardware shipment and related customs procedures);*
- *Installation plan, elaborated to specify how related tasks shall be performed - by authorized technical partners or personnel of national authorities - in designated ports;*
- *Estimations on the sustainable work volume (data of the vessel to be equipped with tested technology and calling port);*
- *Deployment scheduling (by agreeing on a testing calendar for the collection of control data).*

## **2. Deployment**

The installation under the VMS trials must abide by manufacturer's guidelines describing best practices ensuring adequate functioning and the integrity of related cabling in order to assure:

- *Lifespan for all components in line with design specifications;*
- *Protection from power surge events or other electrical issues that may hamper the correct functioning of the transponder or its operational status;*
- *Ease of physical maintenance;*
- *Immunity to electromagnetic interferences determined by on board devices and communication systems (e.g. radar antennas, VHF radios, telephony systems, etc.);*
- *Protection from direct exposure to exhaust gas emissions or other sources of thermal and chemical factors that could affect their operational status or expected lifetime;*
- *Preservation of anti-tampering provisions applied to their design, including those aimed at preventing, identifying and reporting unauthorized physical, electronic or software manipulations.*

Ultimately, it is advised that a record is kept by the GFCM Secretariat of the date and time of effective installation, possibly retaining signatures of both the installer and the vessel owner.

## **3. Training**

For VMS trials to be successful, MCS end users in national authorities will have to be aware of technological features and specificities in order to be able to get the most of the tools being tested. This is expected to be pursued in the context of such trials by:

- *Raising awareness with fishers about how the system works;*
- *Instructing on potential maintenance required (seek supporting material prepared by the manufacturer);*
- *Providing guidance on procedures to be followed, should problems arise;*
- *Informing on the availability online access for collected data (in case the manufacturer provides Companion Apps for vessel operators).*

The transponder provider involved in the VMS trials should be requested to deliver training material to help staff attaining necessary proficiency in the use of their software platform<sup>1</sup> (if any) for key tasks such as:

- *Management of fleet data (vessel name, identity etc.);*
- *Set up and management of closed areas and geofencing alerts;*
- *Daily fleet activity control (location data,).*

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<sup>1</sup> Some providers may provide a simple online platform with basic data consultation features to help users checking on the functioning transponder units. This kind of tool is also generally helpful for cross-checking against technical glitches that may arise during the integration of the units' APIs with the national (or GFCM) VMS platform.

Note: in the case of the VMS trials, such material would be put at disposal by the GFCM provider delivering the Software-as-a-Service (SaaS).

#### **4. Monitoring**

*Following the activation of MCS devices, national authorities are expected to enact the following procedures on a regular basis for the sake of making the most of the VMS trials.*

##### Monitoring and control

- *Monitoring of vessel activity including through geofencing to collect entry/exit from ports by fishing vessels;*
- *Identification of events requiring closer attention (missing reports, tampering alerts...);*
- *Extraction of information relevant for the work of the national authorities;*
- *Recurrent export of data on vessel trips (time at sea)Follow up issues with the VMS provider*
- *Raise support tickets as appropriate;*
- *Request technical assistance when needed;*
- *Schedule regular check-ins;*
- *Keep a close eye on alerts;*
- *Keep a detailed record of what happened when, particularly in relation to mobile signal issues.*

#### **5. Maintenance**

Subsequent to the activation of MCS devices, the following procedures are expected to be enacted to ensure their efficacy under the VMS trials:

- *Remote diagnostics and firmware maintenance: national authorities (or relevant technical partners) should perform accurate remote diagnostics to check the device integrity, operational status and perform software maintenance including firmware updates to enhance the system performance or security measures;*
- *Regular and extraordinary maintenance should be performed based on transponder specifications;*
- *In case some activities require specialized technical intervention, local representatives or technical partners should be indicated by the provider and itemized costs for common tasks should be communicated beforehand;*
- *Programmable transmission frequency: remote overriding of transmission frequency should be enacted based on national priorities for a given fleet segment or group of vessels.*

## **HYBRID TRIALS**

### CENTRALIZED APPROACH

Following the successful integration of transponder APIs, transponder IDs will be shared with the GFCM Secretariat with a view to allowing its pilot regional VMS platform to solely query data from vessels participating in the pilot and for which query rights were granted by the VMS transponder provider.

### DECENTRALIZED APPROACH

As a main prerequisite, FMC software should be able to relay VMS data to other parties. The most widespread formats and protocols are the North Atlantic Format (NAF) and the UN/FLUX format. In the case of NAF, a bilateral setup phase is required by exchanging digital certificates with national institutions; this would in turn allow for NAF messages to be relayed by Contracting Parties over a

secured connection. In the case of UN/FLUX, technical preparations are very limited if the FMC is already using this format for the exchange with other parties. The FMC in question and DG MARE have to configure its system so that VMS messages destined for GFCM are routed to the GFCM secretariat through the FLUX TL network, joined by GFCM in 2021.

### CONTROL TOOLS AVAILABLE

A number of MCS features are currently available through the VMS trials being piloted according to emerging needs by Contracting Parties. The main one is likely to be the GFCM regional pilot VMS. This system is expected to be able to support the most common control activities, including issuing polling commands in the case of a centralised setup, namely by forcing a given vessel to transmit its current location, speed and course regardless the predefined transmission intervals, and technical specifications governing its operation could be made available for information purposes, including through direct liaison with the GFCM Secretariat.

### **DATA ACCESS PROVISIONS**

It is understood that confidentiality and privacy issues represent a major topic to be addressed in the context of the VMS trials. Current technical provisions enable access levels to be set up, in coordination with the platform provider, to provide consultation and querying tools to multiple users. This would permit the Secretariat to duly liaise with Contracting Parties participating in the VMS trials and design access rights based to relevant parameters (i.e. vessel flag, location within/outside closed areas etc.) associated to specific user accounts or groups of users.